

# Technology Opportunity

Technology Transfer &amp; Partnership Office

TOP3-00222

## Combustor Test Facilities at Glenn

### Facility

Glenn Research Center has seven combustor test rigs with varying capabilities offering state-of-the-art instrumentation and data systems.

### Facility Description

**The Advanced Subsonic Combustion Rig (ASCR)**, NASA Glenn's unique high-pressure and high-temperature combustor facility (60 atmospheres), provides NASA and U.S. engine manufacturers the ability to quantify effects of high-pressure on combustor emissions, durability, and operability.

**The Engine Research Building (ERB)** complex houses over 60 test rigs supporting research on all aspects of engine development, providing superior testing of turbomachinery, aerodynamics flow physics, aeropropulsion heat transfer, mechanical components, and combustor facilities.

**The Engine Components Research Lab (ECRL)** houses two separate test rigs. Cell-1B is used to evaluate advanced concepts for full-scale engine and augmentor components. Cell-2B is used to test full-scale sea-level turboshaft engines.

**The Research Combustion Lab (RCL)** has many test cells supporting testing of propulsion components and materials in subscale combustion environments, RCL-23 supports engine combustor development.

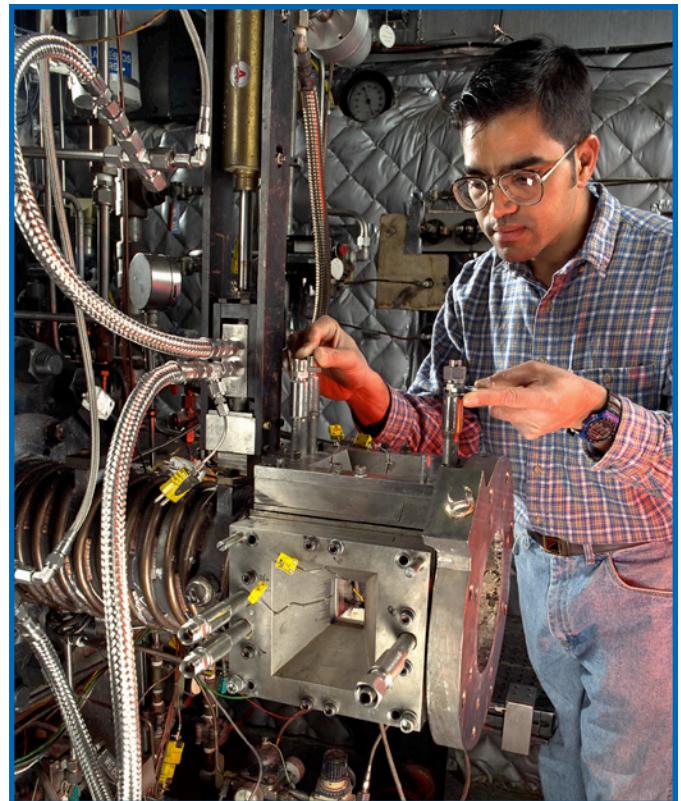
### Facility Benefits

- NASA Glenn has a wide range of combustor test facility capabilities including flametube testing, sector testing, full-annular testing, and full-scale jet engine testing
- ASCR is a one-of-a-kind facility able to simulate combustor tests up to 60 atmospheres
- ERB offers four test stands in CE-5B and CE-9B able to simulate combustor tests up to 30 atmospheres
- ECRL provides flexibility of testing a wide variety of test hardware configurations

- Features nonintrusive laser and gas analysis diagnostic measurements
- Accommodates in-house and private industry research programs
- Highly qualified staff of technicians, engineers, researchers, and operators
- High customer satisfaction

### Commercial Applications

- Aircraft engines
- Aerospace propulsion
- Materials research and development



*Combustion test facility (CE-5B) in Engine Research Building.*

## Programs and Projects Supported

- Fundamental Aeronautics Subsonic and Supersonic Research
- Ultra-Efficient Engine Technology (UEET)
- Low Emissions Alternative Power (LEAP)
- Joint Strike Fighter

## Facility Testing Information

<http://facilities.grc.nasa.gov>

## Contacts

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## Capabilities

Combustor Facilities—ERB, ECRL, ASCR, and RCL					
Facility	Test emphasis	Maximum pressure, psig	Maximum airflow (lb/sec)	Nonvitiated heated air °F	Maximum exhaust temperature, °F
CE-5B-1	Sector	60 to 275	2 to 12	500 to 1,350	3,200
CE-5B-2	Flametube	60 to 400	0.6 to 5	500 to 1,350	3,200
CE-9B-A	Sector	120 to 450	5 to 30	750 to 1,100	3,400
CE-9B-B	Flametube	120 to 450	1 to 15	750 to 1,100	3,400
ASCR Leg 1	Sector	50 to 900	3 to 50	500 to 1,200	3,400
ASCR Leg 2	Flametube	50 to 900	1 to 10	500 to 1,200	3,400
ECRL-1B	Augmentors	5 to 150	5 to 60	100 to 600	1,900
RCL	Flametube	0 to 350	0.5 to 4	500 to 1,200	3,000



*ECRL control room.*